

REMARKS

This timely responds the Office Action mailed on February 19, 2004. Claims 1-39 are currently pending in the application, of which claims 1, 7, 11, 21, 25 and 21 are independent claims. The Office Action indicates that claims 7-20 are allowed, and claims 2-6, 22-24, 27-31, 33, 34 and 36 are objected to but allowable if presented in independent form.

In view of the following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending rejections for the reasons discussed below.

Rejections Under 35 U.S.C. §103

Claims 1, 21, 25, 26, 32, 35 and 37-39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 5,978,059 issued to Ohta, *et al.* ("Ohta") in view of Japanese Patent Publication No. 11-185673 issued to Iguchi ("Iguchi"), further in view of U. S. Patent No. 6,266,122 issued to Kishimoto, *et al.* ("Kishimoto"), further in view of U. S. Patent No. 5,085,973 issued to Shimizu, *et al.* ("Shimizu") and further in view of U. S. Patent No. 6,275,273 issued to Inoue ("Inoue"). Applicants respectfully traverse this rejection for at least the following reasons.

First, regarding the asserted combination of the cited references, the Examiner asserted that "It would have been obvious ... to include the required transparent black matrix/protrusion configuration, in order to have a liquid crystal display device with higher performance" (Office Action, page 3). This assertion is respectfully disagreed with.

MPEP 2142 dictates "*The initial burden is on the examiner* to provide some suggestion of the desirability of doing what the inventor has done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly

suggest the claimed invention or *the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.*" *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

In this regard, as will be further discussed below, the Examiner has not pointed out where in the cited references discloses or suggests the claimed features, thereby failing to establish that the references expressly or impliedly suggest the claimed invention. Also, the Examiner merely described "in order to have a liquid crystal display device with higher performance" but has not presented any convincing line of reasoning *as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.* For these reasons, it is submitted that the Examiner has not established a *prima facie* case of obviousness.

With respect to claim 1, which recites:

"1. A substrate for a liquid crystal display, comprising:
an insulating substrate;
a transparent electrode formed on the insulating substrate;
a black matrix formed on the transparent electrode; and
a protrusion formed on the black matrix."

In the Office Action, the Examiner admitted "Ohta et al. fails to disclose the required black matrix/protrusion configuration, black matrix/protrusion configuration in the required manner, the required transparent electrode/black matrix configuration and the transparent/black matrix configuration in the required manner" (Office Action, page 2 to page 3). Regarding this missing claimed feature, the Examiner asserted that Iguchi, Kishimoto, Shimizu and Inoue disclose these missing claimed features. This assertion is respectfully disagreed with.

Iguchi is directed to a fluorescent display, which is not even a "liquid crystal display", as recited in claim 1. Fig. 2 of Ohta shows black matrix 17 formed on a substrate 15 and covered by

conductive thin films 18 and 19. However, Ohta fails to disclose or suggest the “protrusion formed on the black matrix”, as claimed. This is further evidenced by the fact that the Examiner was not able to point out wherein in Ohta discloses or suggests these claimed features.

Kishimoto is directed to forming a polymer wall 16 on a substrate 100a but does not disclose or suggest any black matrix or any protrusion formed thereon. This is further evidenced by the fact that the Examiner was not able to point out wherein Kishimoto discloses or suggests these claimed features.

Shimizu discloses black matrix 2b formed between color filters 2a on a substrate 1. However, in Shimizu the transparent electrode 2c is formed on the black matrix 2c. Thus, Shimizu fails to disclose or suggest “a black matrix formed on the transparent electrode”, as claimed. Also, there is no protrusion formed on the black matrix, thereby failing to disclose or suggest “a protrusion formed on the black matrix”, as claimed. Shimizu’s failure to disclose or suggest these claimed features are further evidenced by the fact that the Examiner was not able to point out where in Shimizu discloses or suggests these claimed features.

Inoue is directed to forming a black matrix layer 713 on the thin film transistor substrate 701 (see Fig. 7). There is no protrusion formed on the black matrix layer 713. Inoue does not disclose or suggest “a protrusion formed on the black matrix”. This is further evidenced by the fact that the Examiner was not able to point out where in Inoue discloses or suggests this claimed feature.

As explained so far, none of the cited references disclose or suggest the claimed structure of claim 1. Particularly, it should be noted that none of the cited references discloses or suggest “a protrusion formed on the black matrix”. Thus, it is submitted that claim 1 is patentable over the cited references.

With respect to independent claim 21, which reads:

“21. A liquid crystal display, comprising:
a first insulating substrate;
a transparent electrode formed on said first insulating substrate;
a light-blocking layer formed on said transparent electrode and made of metal; and
a protrusion portion made of an organic layer and aligned with the light-blocking layer.”

As previously mentioned, “Ohta et al. fails to disclose the required black matrix/protrusion configuration, black matrix/protrusion configuration in the required manner, the required transparent electrode/black matrix configuration and the transparent/black matrix configuration in the required manner” (Office Action, page 2 to page 3).

Iguchi is directed to a fluorescent display, which is not even a “liquid crystal display”, as recited in claim 1. Fig. 2 of Ohta shows black matrix 17 formed on a substrate 15 and covered by conductive thin films 18 and 19. However, Ohta fails to disclose or suggest the “a protrusion portion made of an organic layer and aligned with the light-blocking layer”, as claimed. This is further evidenced by the fact that the Examiner was not able to point out wherein in Ohta discloses or suggests these claimed features.

Kishimoto is directed to forming a polymer wall 16 on a substrate 100a but does not disclose or suggest any black matrix or any protrusion formed thereon. This is further evidenced by the fact that the Examiner was not able to point out wherein Kishimoto discloses or suggests these claimed features.

Shimizu discloses black matrix 2b formed between color filters 2a on a substrate 1. However, in Shimizu the transparent electrode 2c is formed on the black matrix 2c. Thus,

Shimizu fails to disclose or suggest “a light-blocking layer formed on said transparent electrode and made of metal”, as claimed. Also, there is no protrusion formed on the black matrix, thereby failing to disclose or suggest “a protrusion portion made of an organic layer and aligned with the light-blocking layer”, as claimed. Shimizu’s failure to disclose or suggest these claimed features are further evidenced by the fact that the Examiner was not able to point out where in Shimizu discloses or suggests these claimed features.

Inoue is directed to forming a black matrix layer 713 on the thin film transistor substrate 701 (see Fig. 7). There is no protrusion formed on the black matrix layer 713. Inoue does not disclose or suggest “a protrusion portion made of an organic layer and aligned with the light-blocking layer”. This is further evidenced by the fact that the Examiner was not able to point out where in Inoue discloses or suggests this claimed feature.

As explained so far, none of the cited references disclose or suggest the claimed structure of claim 1. Particularly, it should be noted that none of the cited references disclose or suggest “a protrusion portion made of an organic layer and aligned with the light-blocking layer”. Thus, it is submitted that claim 21 is patentable over the cited references.

With respect to independent claim 25, which reads:

“25. A liquid crystal display (LCD) device, comprising:
a first substrate;
a color filter formed on the substrate;
a black matrix formed on the color filter and surrounding a
pixel region; and
a protrusion formed on the color filter within a pixel region,
wherein the black matrix and the protrusion are formed of
the same material.”

As the Examiner admitted, “Ohta et al. fails to disclose the required black matrix/protrusion configuration, black matrix/protrusion configuration in the required manner, the required transparent electrode/black matrix configuration and the transparent/black matrix configuration in the required manner” (Office Action, page 2 to page 3).

Iguchi is directed to a fluorescent display, which is not even a “liquid crystal display”, as recited in claim 1. Fig. 2 of Ohta shows black matrix 17 formed on a substrate 15 and covered by conductive thin films 18 and 19. However, Ohta fails to disclose or suggest a color filter, thereby failing to disclose or suggest “a black matrix formed on the color filter and surrounding a pixel region”, as claimed. Also, Ohta fails to disclose or suggest “a protrusion formed on the color filter within a pixel region, wherein the black matrix and the protrusion are formed of the same material”. This is further evidenced by the fact that the Examiner was not able to point out where in Ohta discloses or suggests these claimed features.

Kishimoto is directed to forming a polymer wall 16 on a substrate 100a but does not disclose or even suggest any black matrix or any protrusion formed thereon. Thus, Kishimoto fails to disclose or suggest “a black matrix formed on the color filter and surrounding a pixel region; and a protrusion formed on the color filter within a pixel region, wherein the black matrix and the protrusion are formed of the same material”. This is further evidenced by the fact that the Examiner was not able to point out wherein Kishimoto discloses or suggests these claimed features.

Shimizu discloses black matrix 2b formed between color filters 2a on a substrate 1, thereby failing to disclose or suggest “a black matrix formed on the color filter and surrounding a pixel region”. Also, there is no protrusion formed on the black matrix, thereby failing to disclose or suggest “a protrusion formed on the color filter within a pixel region, wherein the black matrix

and the protrusion are formed of the same material”. Shimizu’s failure to disclose or suggest these claimed features are further evidenced by the fact that the Examiner was not able to point out where in Shimizu discloses or suggests these claimed features.

Inoue is directed to forming a black matrix layer 713 on the thin film transistor substrate 701 (see Fig. 7). There is no protrusion formed on the black matrix layer 713. Inoue does not disclose or suggest “a protrusion formed on the color filter within a pixel region, wherein the black matrix and the protrusion are formed of the same material”. This is further evidenced by the fact that the Examiner was not able to point out where in Inoue discloses or suggests this claimed feature.

As explained so far, none of the cited references disclose or suggest the claimed structure of claim 1. Particularly, it should be noted that none of the cited references discloses or suggest “a protrusion formed on the color filter within a pixel region, wherein the black matrix and the protrusion are formed of the same material”. Thus, it is submitted that claim 25 is patentable over the cited references. Claim 26 that is dependent from claim 25 would be also patentable at least for the same reason.

With respect to independent claim 32, which reads:

“32. A method for manufacturing a liquid crystal display (LCD) device, the method comprising steps of:
defining portions of a substrate corresponding to a pixel region and *a protrusion region arranged within the pixel region*;
forming a color filter layer on a substrate;
forming a black matrix layer on the electrode layer; and
etching the black matrix layer to form a protrusion on the protrusion region.”

In this regard, none of the cited references discloses or suggests “defining ... a protrusion region arranged within the pixel electrode; ... forming a black matrix layer on the electrode layer; and etching the black matrix layer to form a protrusion on the protrusion region”. This is further evidenced by the fact that the Examiner has not pointed out where in the cited references discloses or suggests these claimed steps. Since none of the cited references discloses or suggests these claimed features, it would not have been obvious to arrive at the claimed invention by modifying or combining the cited references.

Thus, it is submitted that claim 32 is patentable over the cited references. Claims 35 and 37-39 that are dependent from claim 32 would be also patentable at least for the same reasons.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection of claims 1, 21, 25, 26, 32, 35 and 37-39.

CONCLUSION

Applicants believe that a full and complete response has been made to the pending Office Action and respectfully submit that all of the stated grounds for rejection have been overcome or rendered moot. Accordingly, Applicants respectfully submit that all pending claims are allowable and that the application is in condition for allowance.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact the Applicants' undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,



Hae-Chan Park
Reg. No. 50,114

Date: May 19, 2004

McGuireWoods LLP
1750 Tysons Boulevard
Suite 1800
McLean, VA 22102-4215
Tel: 703-712-5365
Fax: 703-712-5280
HCP:WSC/tmk